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| 10/534,821 | 05/13/2005 | Ken-ichi Masumoto | 2005-0796A | 8749 |

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| EXAMINER |
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RAINEY, ROBERT R

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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,821

Applicant(s)

MASUMOTO ET AL.

Examiner

Robert R. Rainey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 13 May 2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 9 and 14** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 9 and 14 state that “a cathode of the organic EL element ... (is) connected with the earth” and then that “the push-pull circuit connects the ... cathode of the organic EL element with the earth by turning on a switching element between a connecting point and the earth”. This seems to imply that the cathode is both permanently connected and intermittently connected with the earth, making it impossible for one of ordinary skill in the art to determine what structure is actually being claimed. An additional point of confusion is the recitation of “a connecting point”. This seems to indicate a connecting point additional in addition to that recited in claims 8 and 13 upon which 9 and 14 are respectively dependent. It is not clear how to introduce this additional connecting point, making it impossible for one of ordinary skill in the art to determine what structure is actually being claimed.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the relevant features

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must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

As to **claims 4-7, 9 and 14**, the relevant features are a circuit that connects two electrodes to earth when some signal is given or an event occurs. The drawings as submitted show a cathode continuously connected to earth and an anode that is switched by a circuit to connect it to ground. But, to pick one of the claims as an example, claim six states that "the circuit connects both electrodes of the organic EL element with the earth according to a signal".

As to **claims 11 and 16**, the relevant features are those required to show that "a lighting current is fed to the organic EL element through the first switching element from the capacitive element". The drawings submitted indicate only a single capacitor labeled CN. The charge stored on this capacitor determines the amount of current flowing through FET1 from the power supply (item 1 of Fig. 1). This current flowing through FET1 is fed to the first switching element (FET4) to the organic EL element (ELD). But, the claim language indicates that the lighting current comes from the capacitive element. This arrangement is not illustrated.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

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number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Note to art rejections below for claims 4, 7, 9, 11, 14 and 16: Examiner's best understanding is that the applicant's invention is that as illustrated and the art rejections cover a reading of the claims to correspond with the illustrated embodiments.

4. **Figures 10-12** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

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applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0098829 to *Chen et al.* ("*Chen*") in view of U.S. Patent No. 5,723,950 to *Wei et al.* ("*Wei*") and further in view of U.S. Patent No. 6,429,837 to *Ishizuka et al.* ("*Ishizuka*").

As to **claim 1**, *Chen* discloses an active matrix OLED/PLED pixel driving circuit and in particular: a light emitting device comprising: a light emitting element for emitting light by application of a DC forward voltage (see for example Fig. 3A item 36); .

Chen does not expressly disclose a capacitive light emitting element or a circuit configured to feed a reverse current to a defective part with a low-resistance of the light emitting element, only by discharging a residual electric charge in the light emitting element after stopping the application of the DC forward voltage.

Wei discloses a precharge driver for light emitting devices with an associated capacitance and in particular: a capacitive light emitting element (see for example Fig. 1 and column 2 line 58 to column 3 line 5) and a circuit configured to feed a reverse current to the light emitting element, only by discharging a residual electric charge in the light emitting element after stopping the application of the DC forward voltage (see for example Fig. 1. in which FETs 20 and 21 are configured in a push-pull arrangement such that when FET20 is on FET21 is off and vice-versa and when FET21 is on it connects the anode of light emitting element 11 with earth thereby discharging a residual electric charge).

Chen and *Wei* are analogous art because they are from the same field of endeavor, which is matrix type displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to add the push-pull element drive arrangement disclosed by *Wei* to the drive circuit of *Chen* for example by replacing the single FET33 with dual FETs such as FETs 20 and 21, with appropriate polarity considerations. The suggestion/motivation would have been to provide advantages such as to discharge the capacitance of the display element and any signal line capacitances quickly in order to assure quick extinguishment of light emission.

Chen and *Wei* do not expressly disclose feeding a reverse current to a defective part with a low-resistance of the light emitting element.

Ishizuka discloses a driving apparatus for a multi-color light-emitting display panel that uses capacitive light-emitting elements such as organic

electroluminescence elements and in particular: feeding a reverse current to a defective part with a low-resistance of the light emitting element (see for example Figs. 1-4 and column 3 line 66 to column 4 line 53).

Chen, Wei and *Ishizuka* are analogous art because they are from the same field of endeavor, which is matrix type displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to apply the circuit after *Chen* and *Wei* to accomplish the reverse current application to low resistance areas as disclosed by *Ishizuka*. In deed, the structure disclosed by *Chen* as modified by *Wei* performs the claimed invention since the reverse current would preferentially seek any low resistance paths whether or not the reverse current were applied for that purpose. A further argument for obviousness is that *Chen* as modified by *Wei* and further modified by *Ishizuka* discloses the claimed invention except perhaps for the particular voltage level applied to the cathode; *Ishizuka* applies a positive voltage to the cathode while connecting the anode to ground. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine which voltage would be effective and to use earth as that voltage if it proved to be effective, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272,205 USPQ 215 (CCPA 1980). The suggestion/motivation would have been to provide advantages such as to use an existing voltage level to

avoid added expense, or to eliminate defects causing degradation in performance (see for example *Ishizuka* column 1 lines 34-54).

As to **claim 2**, in addition to the rejection of claim 1 over *Chen, Wei* and *Ishizuka*, *Wei* further discloses that the circuit connects respective electrodes of the light emitting element with the earth after stopping the application of the DC forward voltage, said electrodes being applied with the DC forward voltage (see for example Fig. 1 noting the operation of FETs 20 and 21).

As to **claim 3**, in addition to the rejection of claim 2 over *Chen, Wei* and *Ishizuka*, *Ishizuka* further discloses the light emitting element is an organic EL (electro luminescence) element (see for example column 3 lines 40-42).

As to **claim 4**, in addition to the rejection of claim 3 over *Chen, Wei* and *Ishizuka*, *Wei* further discloses that the circuit connects the anode of the organic EL element with the earth whenever the application of the DC forward voltage to the organic EL element stops (see for example Fig. 1 noting the operation of FETs 20 and 21).

Chen, Wei and *Ishizuka* do not expressly disclose that the circuit connects two electrodes of the organic EL element with the earth whenever the application of the DC forward voltage to the organic EL element stops.

Chen, Wei and Ishizuka discloses the claimed invention except for the cathode of the organic EL element being connected to earth whenever the application of the DC forward voltage to the organic EL element stops. It would have been obvious to one having ordinary skill in the art at the time the invention was made to so connect the cathode, since it has been held that omission of an element, in this case FET30 of *Wei* Fig. 1, and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. In re Karison, 136.USPQ 184.

As to **claim 5**, in addition to the rejection of claim 3 over *Chen, Wei and Ishizuka*, *Wei* further discloses that the circuit connects an electrode of the organic EL element with the earth according to a signal for controlling the application of the DC forward voltage to the organic EL element (see for example Fig. 1 noting the operation of FETs 20 and 21 and signal line labeled 23).

Chen, Wei and Ishizuka do not expressly disclose that the circuit connects two electrodes of the organic EL element with the earth according to a signal for controlling the application of the DC forward voltage to the organic EL element.

Chen, Wei and Ishizuka discloses the claimed invention except for the cathode of the organic EL element with the earth according to a signal for controlling the application of the DC forward voltage to the organic EL element. It would have been obvious to one having ordinary skill in the art at the time the invention was made to so connect the cathode, since it has been held that

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omission of an element, in this case FET30 of *Wei* Fig. 1, and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. In re Karison, 136.USPQ 184.

As to **claim 6**, in addition to the rejection of claim 3 over *Chen, Wei* and *Ishizuka*, *Wei* further discloses that the circuit connects an electrode of the organic EL element with the earth according to a signal for controlling the application of the DC forward voltage to the organic EL element (see for example Fig. 1 noting the operation of FETs 20 and 21 and signal line labeled 23).

Chen, Wei and *Ishizuka* do not expressly disclose that the circuit connects both electrodes of the organic EL element with the earth according to a signal different from a signal for controlling the application of the DC forward voltage to the organic EL element.

Chen, Wei and *Ishizuka* discloses the claimed invention except for the use of a signal different from a signal for controlling the application of the DC forward voltage to the organic EL element and the cathode of the organic EL element connected with the earth. It would have been obvious to one having ordinary skill in the art at the time the invention was made to so connect the cathode, since it has been held that omission of an element, in this case FET30 of *Wei* Fig. 1, and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. In re Karison, 136.USPQ 184. And it would have been obvious to one having ordinary skill in the art at the

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time the invention was made to control the connection of the electrodes to earth using a different signal. *Chen, Wei* and *Ishizuka* disclose the claimed invention except for the use of a separate signal. It would have been an obvious matter of design choice to use such a separate signal, since applicant has not disclosed that using a separate signal solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the use of the common signal as in *Chen, Wei* and *Ishizuka* and applicants other claims. The suggestion/motivation for such a design choice would have been to provide advantages such as to prevent potential overlap of on states between the push-pull transistors.

As to **claim 7**, in addition to the rejection of claim 3 over *Chen, Wei* and *Ishizuka*, *Wei* further discloses that the circuit connects the anode of the organic EL element with the earth while the DC forward voltage is not applied to the organic EL element (see for example Fig. 1 noting the operation of FETs 20 and 21).

Chen, Wei and *Ishizuka* do not expressly disclose that the circuit connects both electrodes of the organic EL element with the earth while the DC forward voltage is not applied to the organic EL element.

Chen, Wei and *Ishizuka* discloses the claimed invention except for the cathode of the organic EL element being connected with the earth while the DC forward voltage is not applied to the organic EL element. It would have been

obvious to one having ordinary skill in the art at the time the invention was made to so connect the cathode, since it has been held that omission of an element, in this case FET30 of *Wei* Fig. 1, and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. In re Karison, 136.USPQ 184.

As to **claim 8**, in addition to the rejection of claim 3 over *Chen*, *Wei* and *Ishizuka*, *Chen* as modified by *Wei* and further modified by *Ishizuka* further discloses that the circuit is a push-pull circuit including a first switching element and second switching element that are cascaded (see for example *Wei* Fig. 1 noting FETs 20 and 21), a current feeding circuit is connected with an end of the push-pull circuit (see for example Fig. 3A items 31, 32, 34 and 35), said current feeding circuit feeding a current to the organic EL element, and an anode of the organic EL element is connected with a connecting point of the first switching element and the second switching element (see for example *Wei* Fig. 1 noting FETs 20 and 21 and the connection of the anode of OLED item 11 at their connecting point).

As to **claim 9**, in addition to the rejection of claim 8 over *Chen*, *Wei* and *Ishizuka*, *Chen* as modified by *Wei* and further modified by *Ishizuka* further discloses that another end of the push-pull circuit is connected with the earth, and the push-pull circuit connects the anode of the organic EL element with the

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earth by turning on a switching element between a connecting point and the earth (see for example *Wei* Fig. 1 noting FETs 20 and 21 and the connection of the anode of OLED item 11 at their connecting point).

Chen, Wei and *Ishizuka* do not expressly disclose that a cathode of the organic EL element is connected with the earth.

Chen, Wei and *Ishizuka* discloses the claimed invention except for the cathode of the organic EL element being connected with the earth. It would have been obvious to one having ordinary skill in the art at the time the invention was made to so connect the cathode, since it has been held that omission of an element, in this case FET30 of *Wei* Fig. 1, and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. In re Karison, 136.USPQ 184.

As to **claim 10**, in addition to the rejection of claim 9 over *Chen, Wei* and *Ishizuka*, *Chen* as modified by *Wei* and further modified by *Ishizuka* further discloses that a current for lighting the organic EL element is fed from the current feeding circuit to the organic EL element through the first switching element when the first switching element is turned on and the second switching element is turned off, and subsequently the residual charge in the organic EL element is discharged through the second switching element when the first switching element is turned off and the second switching element is turned on (see for example *Wei* Fig. 1 noting FETs 20 and 21 and the connection of the anode of

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OLED item 11 at their connecting point and noting the driving polarity differences between FET 20 and FET 21).

As to **claim 11**, in addition to the rejection of claim 8 over *Chen, Wei* and *Ishizuka, Chen* as modified by *Wei* and further modified by *Ishizuka* further discloses that the current feeding circuit includes a capacitive element for accumulating an electric charge (see for example *Chen* Fig. 3A item 35), and a lighting current is fed to the organic EL element through the first switching element from the capacitive element of the current feeding circuit when the first switching element is turned on and the second switching element is turned off (see for example *Chen* Fig. 3A item 33, which corresponds also to *Wei* Fig. 1 item 20, as the first switching element, and *Wei* Fig. 1 item 21 as the second switching element).

As to **claim 12**, in addition to the rejection of claim 11 over *Chen, Wei* and *Ishizuka, Chen* as modified by *Wei* and further modified by *Ishizuka* further discloses that the organic EL element performs static lighting by charging the capacitive element of the current feeding circuit with the electric charge when the first switching element is turned off (see for example *Chen* Fig. 3A and [0009]).

Claims 13-17 are identical in language to claims 8-12, lacking only a dependency on previous, broad language, claims, i.e. claim 8 depends from

claim 3, which depends from claim 2, which depends from claim 1. Since the rejections of claims 8-12 include all limitations recited in claims 13-17, claims 13-17 are rejected on the same grounds and arguments as claims 8-12 including their parent claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,486,607 to Yeuan discloses a simple circuit that connects the anode to ground whenever the element is not illuminated; cathode is permanently connected to ground (see Fig. 1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert R. Rainey whose telephone number is (571) 270-3313. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RR/


AMARE MENGISTU
SUPERVISORY PATENT EXAMINER